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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,513	09/09/2003	Yuhong Wang	58970.010500	1783

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EXAMINER

GATES, ERIC ANDREW

ART UNIT PAPER NUMBER

3722

DATE MAILED: 11/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/658,513

Applicant(s)

WANG ET AL.

Examiner

Eric A. Gates

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2006 and 23 August 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 12-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/9/03, 3/11/04, and 1/10/06 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 23 June 2006 has been entered.
2. This office action replaces the office action mailed 27 October 2006 in its entirety.

Response to Amendment

3. This office action is in response to applicant's amendments filed on 23 June 2006 and 23 August 2006.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nygard (U.S. Patent 6,857,832) in view of Greene (U.S. Patent 4,529,341).

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6. Regarding claim 1, Nygard discloses a twist drill for forming holes in or through a workpiece, having a longitudinal axis around which the twist drill is rotated and in the direction of which the twist drill is advanced into the workpiece, and two transverse axes disposed perpendicular to each other and to the longitudinal axis, comprising: a shank (not shown but inherent), for enabling the twist drill to be mounted to a driving device; a body (not referenced) emanating from, and coaxial with the shank, the body having a radius; at least one flute (not labeled, see Figure 2) extending helically along the body; at least one land 10a disposed adjacent to the at least one flute (adjacent through surface 10b); and a point structure 2, formed on an end of the body distal to the shank, the point structure being generally in the form of a brad point having an extreme tip through which the longitudinal axis of the drill passes, the point structure further having two spur structures (outer tips of cutting lip 3) on opposite sides thereof; a cutting lip 3 on a leading edge of each of the spur structures, the drill further including planar axial relief surfaces 10b on trailing surfaces of the lands 10a, the axial relief surfaces being separated from the leading edges of the spur structures by one or more planar cutting edge surfaces 3, wherein the axial relief surfaces are disposed at a separate, substantially steeper angle, relative to a plane perpendicular to the longitudinal axis of the twist drill, than the one or more planar cutting edge surfaces.

Nygard does not disclose wherein the axial relief surfaces intersect the extreme tip. Greene teaches the use of a twist drill 10a that includes axial relief surfaces 38 that intersect the extreme tip 34 for the purpose of conforming to the concave curvature of the cutting edges 36 and for intersecting with the pair of leading bevel surfaces 40 to

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define the sharp cutting edges 36. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the drill of Nygard with the axial relief surfaces of Greene in order to have a twist drill with a point structure and two spur structures that has sharper cutting edges.

7. Regarding claim 2, the modified invention of Nygard discloses wherein the point 2 comprises a first radially outwardly disposed portion (portion in the plane defined by angle alpha) of the at least one land angling inwardly and axially toward the shank, to a position between a peripheral portion of the body, and the longitudinal axis and a second, radially inwardly disposed portion (portion in the plane defined by angle beta) of the at least one land, angling inwardly and axially away from the shank and toward the central point structure.

8. Regarding claim 3, the modified invention of Nygard discloses wherein the first radially outward disposed portion of the at least one land 10a is defined at least in part by a leading edge angle alpha and a trailing edge angle phi, wherein alpha equals $15^{\circ} \pm 10^{\circ}$ (alpha is disclosed as being in the range 1° to 20° , for which the 5° to 20° portion falls within the required range) and phi equals $12^{\circ} \pm 7^{\circ}$ (phi is disclosed as being in the range $10^{\circ} \pm 3^{\circ}$, which falls entirely within the required range).

9. Regarding claim 4, the modified invention of Nygard discloses wherein the second, radially inwardly disposed portion of the at least one land is defined at least in part by a point angle beta and an angle (not referenced but inherent) which represents an axial separation between the central point structure and radially outer portions of the at least one land, wherein beta is between 80 and 100 degrees, inclusive; and the (not

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referenced but inherent) angle measures approximately 140 degrees on Figure 2 and 153 degrees on Figure 4 (falls within the 140 to 170 degrees for this claim).

10. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nygard in view Greene and further in view of Crisp (U.S Patent 2,769,355).

11. Regarding claim 5, the modified invention of Nygard discloses the at least one flute terminating in a cutting lip disposed proximate the point; the at least one flute having a sectional configuration, in a plane perpendicular to the longitudinal axis, incorporating a leading edge, a trailing edge, a straight surface extending inwardly from the leading edge, at least to a position coplanar with a plane passing perpendicularly through the straight surface to the longitudinal axis, and a first concave curved portion, extending from an inward end of the straight surface. Nygard does not disclose a second concave curved portion, extending inwardly from the trailing toward an outer edge region of the first concave curved portion, and a ridge formed by the intersection of the outer edge region of the first concave curved portion and an inner edge region of the second concave curved portion. Crisp discloses a fluted drill that has a first concave curved portion 15 and a second concave curved portion 16 that intersect at a ridge 11 for the purpose of breaking up the cut chips into small pieces. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the drill of Nygard with the concave flute portions and ridge portion of Crisp in order to have a brad type drill that makes small chips during drilling.

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12. Regarding claim 6, the modified invention of Nygard discloses the invention substantially as claimed.

13. Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nygard in view of Greene and Crisp as applied to claims 5 and 6 above, and further in view of Guehring et al. (U.S Patent 6,213,692).

14. Regarding claim 7, the modified invention of Nygard discloses the invention substantially as claimed, except Nygard does not disclose the ridge is in the form of a rounded bump. Guehring et al. teaches the use of grooves 18 on a drill that form ridges in the shape of rounded bumps for the purpose of breaking up the cut chips into small pieces. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the modified drill of Nygard with the rounded bumps of Guehring in order to have a brad type drill that makes small chips during drilling without having stress concentrations at the end of the ridges.

15. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nygard in view of Greene and Crisp, and further in view of Guehring et al. (U.S Patent 6,213,692).

16. Regarding claims 8-11, the modified inventions of Nygard in claims 5, 6, and 7 disclose the inventions substantially as claimed.

Response to Arguments

17. Applicant's arguments with respect to claims 1 and 8 have been considered but are moot in view of the new ground(s) of rejection.

18. Applicant's argument that Nygard may not be further modified to have an extreme point is not persuasive because while the disclosure of Nygard pointed to in the argument does state that the center tip 2 has discrete sides 7, it does not state that these sides are critical such they cannot be modified to intersect the tip as is disclosed by the sides 40 in Greene.

19. For the reasons as set forth above, the rejections are maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric A. Gates whose telephone number is 571-272-5498. The examiner can normally be reached on Monday-Thursday 7:45-6:15.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Monica Carter can be reached on 571-272-4475. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



EAG

7 November 2006



MONICA CARTER
SUPERVISORY PATENT EXAMINER